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PATENT ABSTRACTS OF JAPAN

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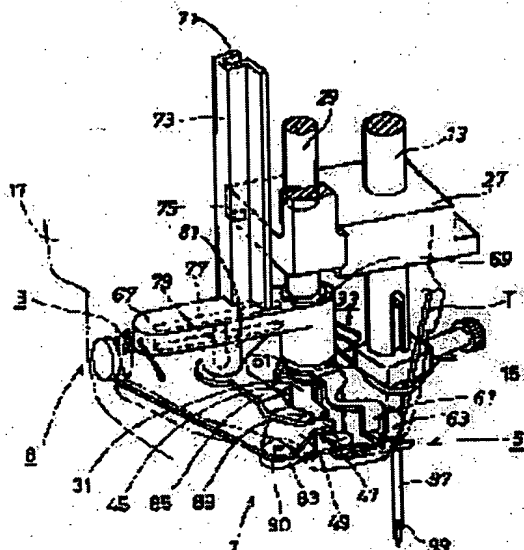
(72)Inventor : YAMADA TAKAHIRO
OGAWA MASAO
SHIBATA EIJI

(54) THREAD END PROCESSING UNIT FOR SEWING MACHINE

(57)Abstract:

PURPOSE: To improve operability by enabling naked-eye observation of thread guard.

CONSTITUTION: A thread guide groove extends vertically on the front side of the sewing machine head, and another thread guide groove is provided on a side of the sewing machine head, this extending from that side to this side. A thread holder 7 for a needle thread T energized roughly in the vertical direction is provided for the thread guide grooves. Downstream of the needle thread holder 7 along the thread guide and above the thread guide grooves, there is a thread holder 8 for the needle thread T energized in the side-to-side direction. The thread holder 8 is so designed that the direction of guiding of the needle thread T may be inverted from rear to front thanks to a shaft extending side to side. Positioned this side of the thread holder 8 and a little higher than the thread holder 8, there is a thread cutter 9 for cutting the end of the upper thread T after inversion.



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CLAIMS

[Claim(s)]

[Claim 1] A margin-of-string processor of a sewing machine which sets Itonaga of a sewing machine which equipped **** of a sewing needle with threader equipment which lets thread pass who begins to sew and is pulled out from **** of this sewing needle in front as predetermined length characterized by providing the following A thread-guard preparation path of the above-mentioned sewing machine of beginning to sew and hanging thread [near the above-mentioned sewing needle] in front from a thread source of supply The thread stop section which is prepared on the above-mentioned preparation path, approaches the above-mentioned sewing needle at the time of a threader while stopping thread, and carries this thread before **** of the above-mentioned sewing needle The thread grasping section which is prepared from the above-mentioned thread stop section on the above-mentioned preparation path at the downstream, is energized by abbreviation perpendicular direction to the above-mentioned preparation path, and grasps the above-mentioned thread The thread cutting section which cuts thread by which is the downstream, and was formed near the sewing-machine side which can be viewed from the above-mentioned thread grasping section on the above-mentioned preparation path, and grasping was carried out [above-mentioned] by the above-mentioned thread stop section to predetermined distance partition *****, and the thread attaching part which it is prepared in the upstream of the above-mentioned thread cutting section, and the downstream of the above-mentioned thread grasping section, and holds in thread after the above-mentioned cutting

[Claim 2] In a margin-of-string processor of a sewing machine according to claim 1 constituted as what descends to a nearby predetermined location and lets thread pass to **** the above-mentioned threader equipment -- the time of a threader -- the above-mentioned hole -- the above-mentioned thread grasping section A margin-of-string processor of a sewing machine characterized by having been energized in the direction of predetermined angle slant from a perpendicular direction to the above-mentioned preparation path so that an insertion initiation side of the above-mentioned thread to the thread grasping section concerned might become caudad, and being constituted so that the above-mentioned thread may be grasped.

[Claim 3] For the above-mentioned thread stop section and the thread grasping section which work also as a part of device of the above-mentioned threader equipment in a margin-of-string processor of a sewing machine according to claim 1 or 2, the above-mentioned thread cutting section and a thread attaching part are the margin-of-string processor of the sewing machine which is attached in a needle-bar base, is constituted possible [vertical movement], and is characterized by to have arranged the above-mentioned thread grasping section rather than the above-mentioned thread attaching part at a front-face side of a sewing machine while being prepared fixed [on the side of a face-plate] on the other hand.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the margin-of-string processor of the sewing machine which sets up the length of the thread pulled out from **** of a sewing needle about the margin-of-string processor of a sewing machine on the occasion of preparation of sewing of the sewing machine equipped with the threader equipment which lets thread pass to **** of a sewing needle in detail.

[0002]

[Description of the Prior Art] After having begun to sew in the sewing machine equipped with threader equipment, pulling out the needle thread from the thread source of supply as pre- preparation and letting a needle thread pass from the former to **** of a sewing needle by predetermined actuation, having lengthened the margin of string and giving stress, it was made to go up and down a sewing needle, and it showed the thread cutter formed in a face-plate or a throat plate etc. with which arranged the cash drawer, the needle thread, and the bobbin thread, and the sewing-machine head was equipped to the bobbin thread, and it was cut.

[0003] There are some which are shown in JP,3-133484,A as such a margin-of-string processor. The sewing machine which equipped **** of a sewing needle with the threader equipment which lets thread pass begins to sew this. In front The thread-guard preparation path of setting Itonaga pulled out from **** of a sewing needle as predetermined length and of being a margin-of-string processor, and a sewing machine beginning to sew and hanging thread [near the sewing needle] in front from a thread source of supply, The thread stop section which is prepared on a preparation path, approaches a sewing needle at the time of a threader while stopping thread, and carries thread before **** of a sewing needle, It is prepared from the thread stop section on a preparation path at the downstream, and has the thread grasping section which is energized by the abbreviation perpendicular direction to a preparation path, and grasps thread, and the thread cutting section which cuts the thread formed and grasped by the downstream from the thread grasping section on the preparation path from the thread stop section by predetermined distance partition *****.

[0004] The procedure of margin-of-string processing and actuation by this margin-of-string processor are explained with reference to drawing 7 . if the edge of the thread T pulled out from the thread source of supply which begins to sew and is not a drawing example in front is drawn along the thread-guard preparation path 101,103 top as an operator is also for a finger, first, Thread T will be stopped by the thread stop section 105, and will be grasped by the thread grasping section 107 continuously energized by the abbreviation perpendicular direction to the thread-guard preparation path 103. Furthermore, if the margin of string is led to the downstream, Thread T becoming it tense between the margin of string and the thread grasping section 107, by predetermined distance partition ***** , the thread cutting section 109 will be reached and it will be cut from the thread stop section 105. Although the thread stop section 105 which stopped Thread T at the time of a threader approaches before **** 199 of a sewing needle 197, since the distance of the stop location at this time and the thread grasping section 107 is fixed, Itonaga from the cut margin of string to a stop location becomes fixed, and Itonaga pulled out from ****

199 of the sewing needle 197 behind a threader always becomes a predetermined value.

[0005] However, in order for Thread T to invade into the thread grasping section 107 since it is the configuration in which the presser-foot pan energized by the abbreviation perpendicular direction to the thread-guard preparation path 103 presses Thread T, and to enable it to grasp certainly, the thread grasping section 107 needed to establish the thread-guard preparation path 103 to the back of the sewing-machine head 117, as shown in drawing 7 (A). That is, in order to make it Thread T go to the inside side of the presser-foot pan of the thread grasping section 107, as shown in drawing 7 (B), it needed to have Thread T so that the thread grasping section 107 might be rolled.

[0006] The thread cutting section 109 for carrying out margin-of-string processing sees from an operator side, and it is located in the background of a sewing machine, and while the operator who is in the transverse plane of a sewing machine views and checks, it is impossible therefore, to do a thread-guard activity, although it cannot lead to the thread cutting section 109 unless an operator moves the margin of string until after the sewing-machine head 117 like the arrow head Y in drawing 7 (A). Consequently, if the operator itself did not move and view to a location which does the activity by groping or is visible to the background of a sewing machine each time, it was that it was *****. Therefore, the further improvement is expected in respect of the certainty and the operability of an activity.

[0007] Then, the margin-of-string processor of the sewing machine of this invention solves the above-mentioned technical problem, and it aims at raising the certainty and the operability of the dead work for sewing of a sewing machine.

[0008]

[Means for Solving the Problem and its Function and Effect] Invention according to claim 1 made in order to attain the above-mentioned purpose It is the margin-of-string processor of a sewing machine which sets Itonaga of a sewing machine which equipped **** of a sewing needle with threader equipment which lets thread pass who begins to sew and is pulled out from **** of this sewing needle in front as predetermined length. A thread-guard preparation path of the above-mentioned sewing machine of beginning to sew and hanging thread [near the above-mentioned sewing needle] in front from a thread source of supply, The thread stop section which is prepared on the above-mentioned preparation path, approaches the above-mentioned sewing needle at the time of a threader while stopping thread, and carries this thread before **** of the above-mentioned sewing needle, The thread grasping section which is prepared from the above-mentioned thread stop section on the above-mentioned preparation path at the downstream, is energized by abbreviation perpendicular direction to the above-mentioned preparation path, and grasps the above-mentioned thread, The thread cutting section which is the downstream, is prepared near the sewing-machine side which can be viewed from the above-mentioned thread grasping section on the above-mentioned preparation path, and cuts thread by which grasping was carried out [above-mentioned] by predetermined distance partition ***** from the above-mentioned thread stop section, It is the margin-of-string processor of a sewing machine characterized by having a thread attaching part which is prepared in the upstream of the above-mentioned thread cutting section, and the downstream of the above-mentioned thread grasping section, and holds thread after the above-mentioned cutting.

[0009] If the margin of string which began to sew and was before pulled out from a thread source of supply is drawn along a thread-guard preparation path top according to this margin-of-string processor, first, thread will be stopped by the thread stop section and will be grasped by the thread grasping section continuously energized by abbreviation perpendicular direction to a thread-guard preparation path. Furthermore, if the margin of string is led to the downstream, thread is held at a thread attaching part, can reach the thread cutting section of a thread attaching part lower stream of a river, and can be cut. In addition, since thread is held at a thread attaching part, whether thread is turned off by the thread cutting section can choose an operator. Also in which selection, certainly, thread is applied and is held. And in case it cuts, since it can cut easily if it pulls on the basis of a thread attaching part and leads to the thread cutting section, it is easy to carry out cutting actuation.

[0010] And since the thread cutting section is prepared near the sewing-machine side which can be viewed, it can perform cutting for an operator, viewing. Thus, since it can carry out viewing margin-of-

string processing, certainty and the operability of the activity improve more. The thread cutting section for carrying out margin-of-string processing sees from an operator side, and it is located in a background of a sewing machine, and while an operator views and checked, it was impossible that is, to work conventionally, as shown in drawing 7. Therefore, although the operator itself had to move and view to a location which does the activity by groping or is visible to a background of a sewing machine each time, in ****, while an operator views, cutting can be performed and certainty and the operability of an activity at the point improve.

[0011] In addition, at the time of a threader, although the thread stop section which stopped thread approaches before **** of a sewing needle, since distance of a stop location at this time and the thread grasping section is fixed, Itonaga from the cut margin of string to a stop location becomes fixed, and Itonaga pulled out from **** of a sewing needle behind a threader always becomes a predetermined value.

[0012] Moreover, as shown in claim 2, the thread grasping section can consider it being energized in the direction of predetermined angle slant from a perpendicular direction to a preparation path, and grasping thread so that an insertion initiation side of thread to the thread grasping section concerned may become caudad. This does so the following operation and effects. That is, at the time of a threader, threader equipment descends from an initial valve position (it is up), it moves even to a predetermined lower part location near the ****, and a threader activity is started in the location. Under the present circumstances, although it is not going to move since a margin-of-string portion is held at a thread attaching part, but the thread grasping section tends to push thread caudad. The thread grasping section is energized in the direction of predetermined angle slant from a perpendicular direction to a preparation path, and since it is the direction of slant where an insertion initiation side of thread to the thread grasping section becomes caudad. According to an inclination to the direction of slant, thread will go into the thread grasping section, close will come to go to inside, and it will be grasped much more certainly.

[0013] Although it is also possible to operate it so that thread may fully enter into the thread grasping section during actuation of, of course leading thread along a thread-guard preparation path top, for that purpose, an operator needs to pull thread strongly intentionally and needs to lead it to inside. If this configuration is adopted, in actuation of leading thread along a thread-guard preparation path top, into the thread grasping section, even if there is not close [enough], close comes to go to inside to inside automatically by motion of subsequent threader equipment, and thread is desirable to formation of a positive grasping condition.

[0014] Especially in a thing shown in claim 3, the thread stop section and the thread grasping section which work also as a part of device of threader equipment are attached in a needle-bar base, and it is constituted possible [vertical movement], and on the other hand, while the above-mentioned thread cutting section and a thread attaching part are prepared in the side of a face-plate fixed, the thread grasping section is arranged rather than a thread attaching part at a front-face side of a sewing machine. Therefore, if it leads to a sewing-machine side side from a sewing-machine near side in accordance with a thread-guard preparation path after an operator makes the thread stop section stop thread, since thread results in a thread attaching part and the thread cutting section, actuation will tend to give it.

[0015]

[Example] In order to clarify further a configuration and an operation of this invention explained above, the example of the margin-of-string processor of the sewing machine of this invention is explained below. The perspective diagram of the threader equipment with which drawing 1 was equipped with the margin-of-string processor (only henceforth a margin-of-string processor) of the sewing machine as one example, and drawing 2 are the outline perspective diagrams of the sewing-machine head equipped with the threader equipment.

[0016] This margin-of-string processor as a thread-guard preparation path of hanging a needle thread T in advance of sewing. It has the thread stop section 5 prepared on the thread-guard preparation path between two tension-thread-guard slots 1 and 3 formed in the sewing-machine head, and the tension-thread-guard slots 1 and 3 of those, the thread grasping section 7 prepared inside the tension-thread-guard slot 3, and the thread attaching part 8 and the thread cutting section 9 which were prepared in the

end point location of the tension-thread-guard slot 3.

[0017] As shown in drawing 2, the tension-thread-guard slot 1 was extended and formed in the vertical direction in the lower part (the direction of the sewing-machine base which is not illustrated) from the up thread guard 11 prepared in the sewing-machine upper part, and has extended even near the needle bar thread guide 15 with which the needle bar 13 was equipped. on the other hand -- the tension-thread-guard slot 3 -- the head of a sewing machine -- the slanting upper part from the operator side lower part of the wrap face-plate 17 -- going -- the side of a sewing-machine head -- it is formed a little in the back side.

[0018] The thread stop section 5 and the thread grasping section 7 bear a part of device of the threader equipment mentioned later, and explain it with reference to drawing 1 about this threader equipment. Threader equipment is parallel to the needle bar 13 insertion support of the vertical movement of on the needle-bar base 27 fixed to a sewing-machine machine frame (illustration abbreviation) is enabled, and equips the needle-bar base 27 with the threader rod 29 insertion support of the vertical movement of is enabled. The hook attaching part 31 has fixed in the lower limit section of this threader rod 29, and the hook section 33 which extends at a level with this hook attaching part 31, and is bent in the direction of an abbreviation right angle is attached.

[0019] The hook section 33 consists of hook 37 by which the hook 35 of the shape of a hand of ** was formed at the tip, and hook guards 41 and 43 of two sheets who are located in the both sides of a hook and by whom the thread installation slot 39 was formed at the tip in the shape of a "V" character, as shown in drawing 4. Moreover, as shown in drawing 1, the protrusion piece 45 which extends to the hook attaching part 31 in the hook section 33 and an opposite direction is formed in one. The thread guide piece 47 and the pan support piece 49 are projected and formed at the tip of this protrusion piece 45. Horizontally, the thread guide piece 47 has projected the projection and the pan support piece 49 in the direction of bottom slant so that a tip may fall a little.

[0020] Further, the hook attaching part 31 is inserted into the lower limit of the threader rod 29 up and down in the shape of a "KO" character, the link lever 51 formed pivotable to the threader rod 29 is attached in it, and the pin 53 protrudes on the edge which extended to the horizontal direction of this lever 51 perpendicularly. Moreover, the thread stop section 5 has fixed in the "KO" character-like back of the link lever 51.

[0021] The thread stop section 5 consists of the stationary plate 55 fixed behind the link lever 51 as shown in drawing 5, the arms 57 and 59 on which the projection center section curved horizontally from a stationary-plate 55 top and a lower limit, a presser-foot pawl 61 which extended down from the protrusion direction tip of an arm 57, and a thread-guard pawl 63 which extended above from the protrusion direction tip of an arm 59, and these are formed in one. While the presser-foot pawl 61 curves in the direction in which the tip separates from a stationary plate 55, the thread-guard slot 65 is formed in the curve starting position.

[0022] As shown in the threader rod 29 at drawing 1, in the upper part of the hook attaching part 31, the sliding guide 67 projects to the opposite direction of a needle bar 13, and is inserted, and the vertical location is regulated by the ring E 69. Furthermore, it is parallel to the threader rod 29 to the sliding guide 67, the housing 73 by which the slot 71 was formed in shaft orientations is formed in one, and the pin 75 which protruded on the needle-bar base 27 has fitted in loosely in this slot 71. Therefore, although this sliding guide 67 and housing 73 will also move up and down in one in connection with this if the threader rod 29 moves up and down, it does not follow to axial rotation of the threader rod 29.

[0023] The guide slot 77 of necessary length is drilled by the sliding guide 67, and the link pin 79 which constitutes a link mechanism in this guide slot 77 fits loosely into it free [sliding]. This link pin 79 supports the 1st link board 81 and the 2nd link board 85 to revolve. As the 1st link board 81 is shown in drawing 3 (A), the link pin 79 and the pin 53 which protruded on the link lever 51 are respectively inserted in both ends pivotable.

[0024] Moreover, as for the other end of the 2nd link board 85 with which the end was supported to revolve by the link pin 79, a pin 89 is inserted in pivotable in common with the tip of the protrusion piece 45 of the hook attaching part 31. Thus, a link mechanism is constituted by the 1st link board 81

and the 2nd link board 85 which are supported to revolve in common by the link pin 79, the link lever 51 connected with this 1st link board 81 through a pin 53, and the protrusion piece 45 connected with the 2nd link board 85 through a pin 89.

[0025] The thread grasping section 7 is attached in the pan support piece 49 of this protrusion piece 45, and is constituted as follows. That is, as shown in drawing 6, the presser-foot pan 83 and the pan support piece 49 are held in the pressure-welding condition by forming the presser-foot pan 83 supported to revolve by the support pin 90 possible [sliding] in near the tip of the pan support piece 49 projected in the direction of bottom slant so that a tip may fall a little, equipping with a coil spring 91 inside this presser-foot pan 83, and energizing the presser-foot pan 83 in the pan support piece 49 direction. In addition, the presser-foot pan 83 is faced at the pan support piece 49, and the thread omission slot 93 is cut in predetermined distance detached building ***** along the thread guide from the support pin 90.

[0026] Next, the thread attaching part 8 and the thread cutting section 9 are explained. The thread attaching part 8 and the thread cutting section 9 are formed in the side of the face-plate 17 which hits above the trailer of the tension-thread-guard slot 3. The thread attaching part 8 is the same configuration of the above-mentioned thread grasping section 7 fundamentally, and the same thing as the presser-foot pan 83 in the thread grasping section 7 is energized in the face-plate 17 direction. And the thread cutting section 9 is arranged rather than the thread attaching part 8 as thread at the near side (front-face side of a sewing machine). However, as a thread-guard preparation path, it becomes the downstream from the thread attaching part 8. And the thread cutting section 9 is equipped with the cutter which the blade surface turned to up.

[0027] In order to bring the thread T led to the trailer of the tension-thread-guard slot 3 to the thread cutting section 9 as the thread attaching part 8 is rolled a semicircle grade if the flow of thread is explained briefly, Thread T is held firmly at the thread attaching part 8. The cutter of the thread cutting section 9 can cut Thread T easily with hauling with the edge of Thread T in the condition.

[0028] Next, in advance of sewing, actuation of the thread guard as a dead work is explained. The user of a sewing machine prepares the needle thread T supplied from **** 95 in following order, as shown in drawing 2. First, a needle thread T is hung on the up thread guard 11, and it introduces into the tension-thread-guard slot 1, and hangs on a needle bar thread guide 15. And if a needle thread T is guided to the tension-thread-guard slot 3, lengthening the margin of string leftward, in this process, a needle thread T will be introduced inside the presser-foot pawl 61 from the outside of the thread-guard pawl 63, and will be stopped by the thread-guard pawl 63 (refer to drawing 1).

[0029] Then, if the margin of string is guided in the direction of arrow head d of drawing 2, as shown in drawing 6 (A), a needle thread T will slide on the point inferior surface of tongue of the pan support piece 49 in the direction of arrow head e, and will be inserted between the presser-foot pans 83 and the pan support pieces 49 which constitute the thread grasping section 7. Furthermore, if the margin of string is guided in the direction of arrow head d of drawing 2, a needle thread T can be drawn near in the direction of a center, i.e., the support pin 90 direction, (the direction of arrow head f of drawing 6 (B)), and will be pinched still more firmly.

[0030] And as termination of housekeeping operation, a needle thread T is led to the end point section of the tension-thread-guard slot 3, and as mentioned above, it is in the condition held at the thread attaching part 8, and it is cut in the thread cutting section 9 in the downstream. That is, this thread-guard housekeeping operation is ended only in a series of actuation of guiding a needle thread T along the tension-thread-guard slots 1 and 3. In addition, in this condition, since the thread cutting section 9 and the thread grasping section 7 are in a predetermined location, Itonaga from the cut margin of string to the thread grasping section 7 becomes always fixed.

[0031] Drawing 1 and drawing 3 (A) express the condition that the needle thread T was prepared in this way. Next, actuation of threader equipment equipped with the margin-of-string processor is explained. In addition, this actuation is made based on rise-and-fall / rotation actuation of the threader rod 29, and is indicated by an applicant's for this patent JP,61-35188,Y about the details of the device in which actuation of this threader rod 29 is managed. The following is explained focusing on a motion of each

part of threader equipment.

[0032] As mentioned above, when a needle thread T is prepared, an operator operates a control lever (illustration abbreviation), drops the threader rod 29, and makes it rotate in the direction of arrow head g of drawing 3 (A) further. At this time, the hook section 33 and the protrusion piece 45 which fixed on the threader rod 29 rotate with rotation of the threader rod 29 in the arrow head h and the direction of i of this drawing (B), respectively, and the hook 37 of the hook section 33 intrudes **** 99 of a sewing needle 97. By rotation of the protrusion piece 45, the link pin 79 which fitted in loosely in the guide slot 77 of the sliding guide 67 moves in the direction of arrow head j through the 2nd link board 85, and moves a pin 53 in the direction of arrow head k through the link board 81 further. Therefore, the link lever 51 is also rotated in the direction of arrow head k, and the thread stop section 5 fixed behind the link lever 51 rotates in the direction of arrow head m, and approaches a sewing needle 97.

[0033] By such actuation, in the needle thread T grasped by the thread grasping section 7 in the end, since the elongation of the thread grasping section 7 and the thread stop section 5 becomes large, the needle thread T in the meantime becomes it tense. The thread-guard pawl 63 holding stress of the needle thread T between the thread grasping sections 7 by rotation of the thread stop section 5 at this time, it slides on a thread source-of-supply side, and the sag of the needle thread T by the side of a thread source of supply is absorbed. If it furthermore rotates and the thread-guard pawl 63 approaches a sewing needle 97, it will separate from the thread-guard pawl 63, and will be introduced into the thread-guard slot 65 of the presser-foot pawl 61, a needle thread T will become it tense between this thread-guard slot 65 and the thread grasping section 7, and a needle thread T will be guided before **** 99 of a sewing needle 97 (condition of drawing 3 (B)). In this condition, as hook 37 is shown in drawing 4 (A), **** 99 of a sewing needle 97 is intruded and the tense needle thread T is introduced inside [hand] ** of a hook 35.

[0034] On the other hand, since the presser-foot pan 83 keeps away from the threader rod 29 with the link pin 79, to inside, the needle thread T grasped by the thread grasping section 7 is got blocked to inside, and it is [the needle thread] hard the directions pin 90 direction (the direction of arrow head f of drawing 6 (B)), it is pinched still more firmly, and does not slide in the direction of the thread stop section 5 to stress of a needle thread T while a needle thread T becomes it tense. Therefore, since a needle thread T fully becomes it tense between this thread grasping section 7 and the thread stop section 5, a needle thread T is introduced into the hook guards' 41 and 43 thread installation slot 39, and is certainly caught by the hook 35 of hook 37. Moreover, since a needle thread T is grasped by the thread grasping section 7 and does not slide, Itonaga from the margin of string to the thread stop section 5 becomes always fixed.

[0035] Next, if the inverse rotation of the threader rod 29 is made to carry out in the direction of arrow head n of drawing 3 (C), the protrusion piece 45 will rotate the hook section 33 in the direction of arrow head p while it keeps away from a sewing needle 97 in the direction of arrow head o. Therefore, the thread stop section 5 rotates in the direction of arrow head r, and each part material which constitutes a link mechanism keeps away from a sewing needle 97 while it operates so that it may return to the actuation mentioned above, and the thread grasping section 7 moves in the direction of arrow head q. At this time, as it separates from there by this migration, stress is solved and it is shown in drawing 4 (B), the needle thread T stopped by the thread-guard slot 65 of the thread stop section 5 is caught by hook 37, and is pulled out from **** 99 of a sewing needle 97. A needle thread T bends by the hook 35 of hook 37, the sag of the needle thread T between this hook 35 and the thread grasping section 7 is absorbed by drawing actuation of this hook 37, and a needle thread T becomes it tense again by it.

[0036] Furthermore, if the force of the direction of arrow head o of drawing 3 (C) keeps on working on hook 37, the retention span will lose the force which hook 37 draws out in the needle thread T grasped by the thread grasping section 7, and it will slide in the direction of arrow head s of drawing 3 (C). Since the gap of the presser-foot pan 83 and the pan support piece 49 has become wedge-like as shown in drawing 6 (B), a needle thread T will move in the direction of arrow head t, and if this slide starts, as shown in this drawing (C), it will fall into the thread omission slot 93. therefore, the press from the presser-foot pan 83 cancels [a needle thread T] -- having -- the inside of this thread omission slot 93 -- resistance -- in order to slide few, a needle thread T is easily drawn out for stress of the needle thread T

between the thread grasping section 7 and the hook 35 of hook 37 from **** 99 of a sewing needle 97 with looseness and drawing actuation of hook 37.

[0037] The threader rod 29 starts rise actuation, after the inverse rotation of a predetermined angle is completed. By this rise actuation, the hook section 33, the thread stop section 5, and the thread grasping section 7 go up to one with each part material which constitutes a link mechanism. Although the needle thread T caught by the hook 35 of hook 37 at this time can be pulled up as shown in drawing 4 (C), and further drawn out from **** 99, in that rise process, with the self-weight of the frictional force in **** 99 of a needle thread T, or a needle thread T etc., it becomes impossible for hook 37 to be unable to hold a needle thread T, and it separates from a needle thread T from a hook 35.

[0038] According to the margin-of-string processor of the sewing machine of this example explained above, the following effects are done so.

** If the margin of string which began to sew and was before pulled out from **** 95 is drawn along a thread-guard preparation path top, first, Thread T will be stopped by the thread stop section 5, and will be continuously grasped by the thread grasping section 7. Furthermore, if the margin of string is led to the downstream, Thread T is held at the thread attaching part 8, and can be cut in the thread cutting section 9 of thread attaching part 8 lower stream of a river. In addition, since it is held at the thread attaching part 8, as for Thread T, whether thread is turned off by the thread cutting section 9 can choose an operator. Also in which selection, certainly, Thread T is applied and is held. And in case it cuts, since it can cut easily if it pulls on the basis of the thread attaching part 8 and leads to the thread cutting section 9, it is easy to carry out cutting actuation. And since the thread attaching part 8 and the thread cutting section 9 are formed near the sewing-machine side which can be viewed, they can perform cutting for an operator, viewing.

[0039] Thus, since it can carry out viewing margin-of-string processing, the certainty and the operability of the activity improve more. The thread cutting section 109 for carrying out margin-of-string processing sees from an operator side, and it is located in the background of a sewing machine, and while an operator views and checked, it was impossible that is, to work conventionally, as shown in drawing 7. Therefore, although the operator itself had to move and view to a location which does the activity by groping or is visible to the background of a sewing machine each time, in ****, while an operator views, cutting can be performed and the certainty and the operability of an activity at the point improve.

** In addition, the thread stop section 5 and the thread grasping section 7 are formed from the upstream on a thread-guard preparation path, and further, since the thread attaching part 8 and the thread cutting section 9 were formed in the end point section, the margin-of-string length which is the distance from **** 99 of a sewing needle 97 to the margin of string about a needle thread T can be cut by predetermined length at the time of termination of actuation of a single string of the thread guard prepared in advance of sewing. On the other hand, when a needle thread T is pulled out from **** 99 of a sewing needle 97, since the needle thread T pinched by the thread grasping section 7 falls into the thread omission slot 93, it does not bar this cash drawer.

** The thread grasping section 7 of this example is energized in the direction of predetermined angle slant from the perpendicular direction to a thread-guard preparation path, and he is trying to grasp thread again (drawing 1 , 6 reference). Although it is not going to move since the margin-of-string portion is held at the thread attaching part 8 but the thread grasping section 7 tends to push Thread T caudad by this if threader equipment descends at the time of a threader. Since the presser-foot pan 83 of the thread grasping section 7 is energized in the direction of predetermined angle slant, according to the inclination to the direction of slant, Thread T can be drawn near into the thread grasping section 7 in inside (the direction of arrow head f of drawing 6 (B)), i.e., the support pin 90 direction, and will be grasped much more certainly.

[0040] Although it is also possible to operate it so that Thread T may fully enter into the thread grasping section 7 during actuation of, of course leading Thread T along a thread-guard preparation path top, for that purpose, an operator needs to pull Thread T strongly intentionally and needs to lead it to inside. If it is this configuration, in actuation of leading Thread T along a thread-guard preparation path top, into the

thread grasping section 7, even if there is not close [enough], close comes to go to inside to inside automatically by motion of subsequent threader equipment, and Thread T is desirable to formation of a positive grasping condition.

[0041] And the thread attaching part 8 and the thread cutting section 9 can be brought more to the front-face side of a sewing machine by constituting so that it may be energized in the direction of the predetermined angle slant from a perpendicular direction [as opposed to / if it says further. / in this way / a thread-guard preparation path for the thread grasping section 7] and Thread T may be grasped, and making it close go to inside to inside automatically [thread]. That is, as shown in drawing 3 , by the thread grasping section 7, Thread T is bent the degree of predetermined angle, and enters into the thread grasping section 7, but it is easy to enter, so that this angle bent is large. If the thread grasping section 7 is energized in the direction of predetermined angle slant from the perpendicular direction to a thread-guard preparation path as described above, Thread T will become easy to enter into the thread grasping section 7 here by the configuration itself. Therefore, if the thread grasping section 7 compares with what is energized by the perpendicular direction to a thread-guard preparation path, the thread attaching part 8 and the thread cutting section 9 can be brought more to the front-face side of a sewing machine.

[0042] Although the example of this invention was explained above, as for this invention, in the range which is not limited to such an example at all and does not deviate from the summary of this invention, it is needless to say that it can carry out in the mode which becomes various.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the perspective diagram of threader equipment equipped with the margin-of-string processor of the sewing machine as one example.

[Drawing 2] It is the outline perspective diagram of the sewing-machine head equipped with threader equipment.

[Drawing 3] It is explanatory drawing showing actuation of threader equipment equipped with the margin-of-string processor.

[Drawing 4] It is explanatory drawing showing actuation of the hook section.

[Drawing 5] It is the perspective diagram of the thread stop section.

[Drawing 6] It is explanatory drawing showing actuation of the thread grasping section.

[Drawing 7] It is explanatory drawing showing the conventional margin-of-string processor.

[Description of Notations]

1 Three -- Tension-thread-guard slot 5 -- Thread stop section

7 -- Thread grasping section 8 -- Thread attaching part

9 -- Thread cutting section 11 -- Up thread guard

13 -- Needle bar 17 -- Face-plate

27 -- Needle-bar base 31 -- Hook attaching part

33 -- Hook section 37 -- Hook

45 -- Protrusion piece 47 -- Thread guide piece

49 -- Pan support piece 51 -- Link lever

53 -- Pin 61 -- Presser-foot pawl

63 -- Thread-guard pawl 77 -- Guide slot

79 -- Link pin 81 -- The 1st link board

83 -- Presser-foot pan 85 -- The 2nd link board

89 -- Pin 90 -- Support pin

91 -- Coil spring 93 -- Thread omission slot

95 -- **** 97 -- Sewing needle

99 -- hole T -- Thread (needle thread)

[Translation done.]

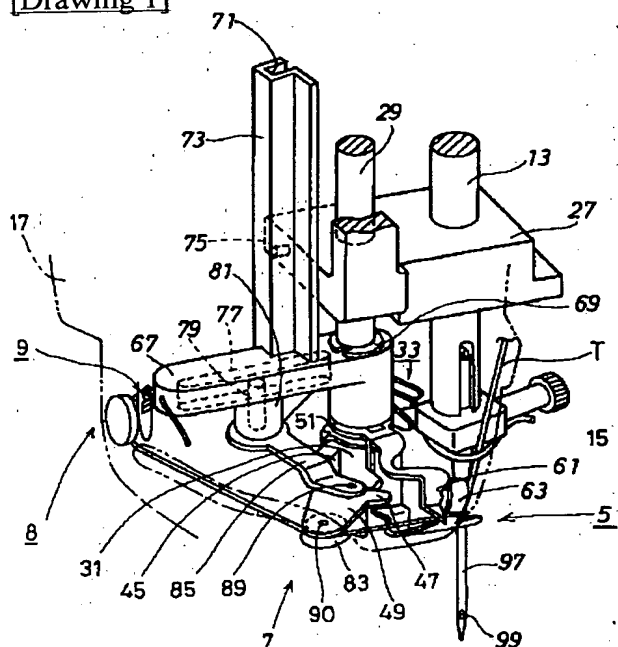
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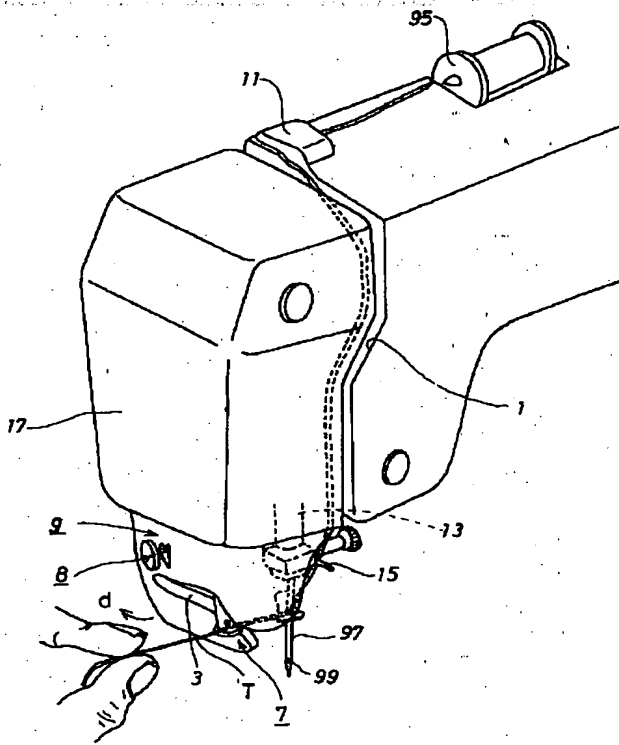
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DRAWINGS

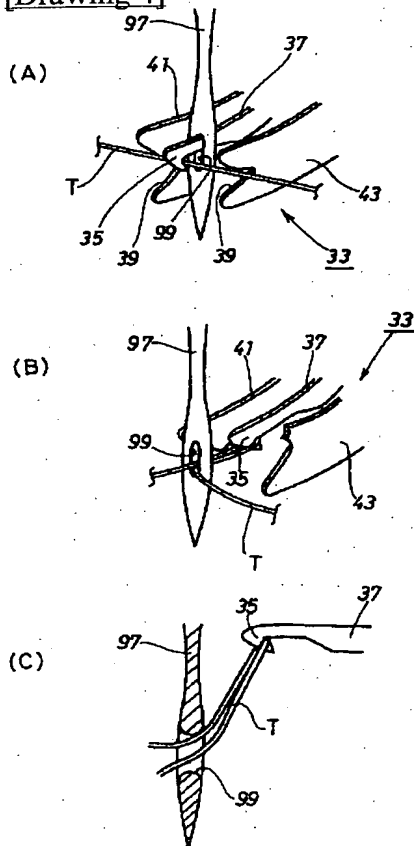
[Drawing 1]



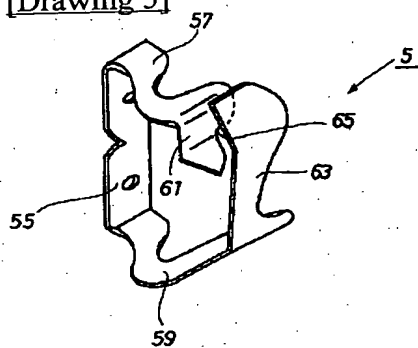
[Drawing 2]



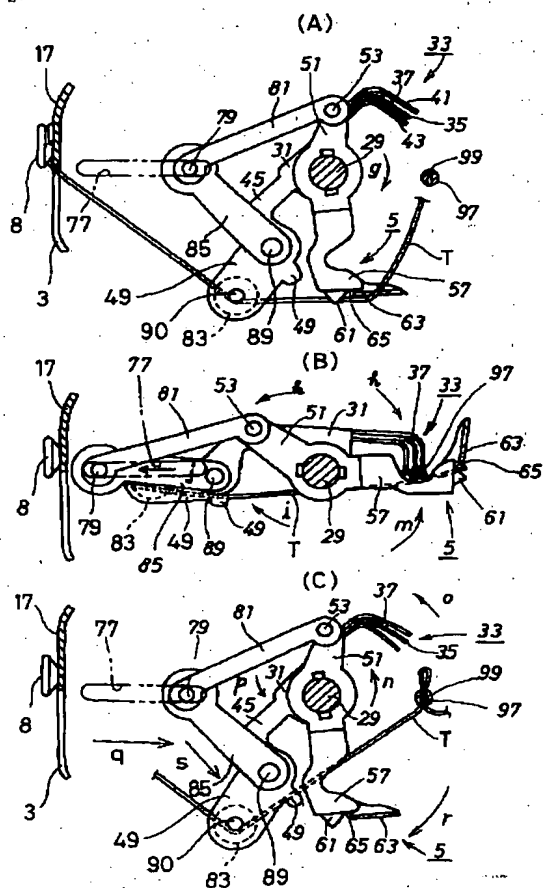
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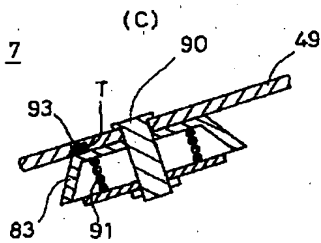
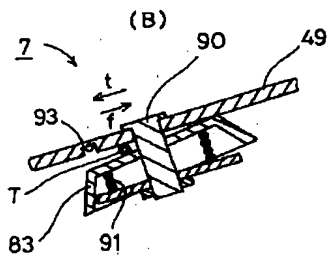
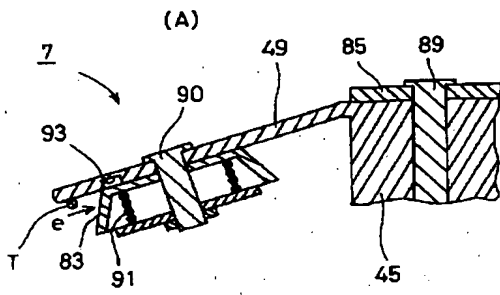
[Drawing 5]



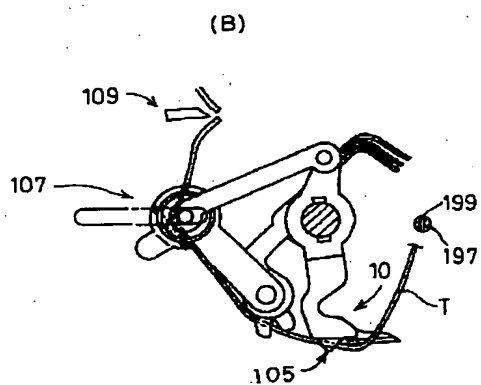
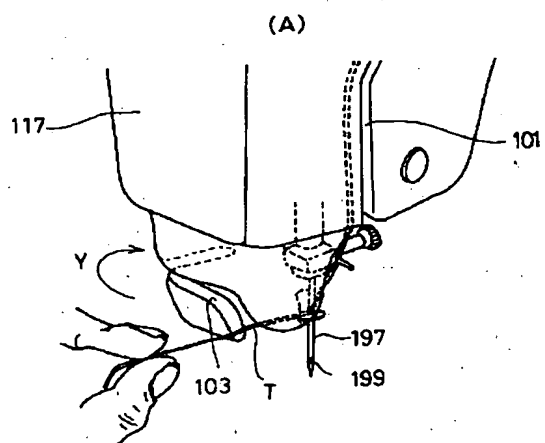
[Drawing 3]



[Drawing 6]



[Drawing 7]



[Translation done.]

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(71) 出願人 000005267

ブラザー工業株式会社

愛知県名古屋市瑞穂区苗代町15番1号

(72) 発明者 山田 高弘

愛知県名古屋市瑞穂区苗代町15番1号

ブラザー工業株式会社内

(72) 発明者 小川 雅夫

愛知県名古屋市瑞穂区苗代町15番1号

ブラザー工業株式会社内

(72) 発明者 柴田 英治

愛知県名古屋市瑞穂区苗代町15番1号

ブラザー工業株式会社内

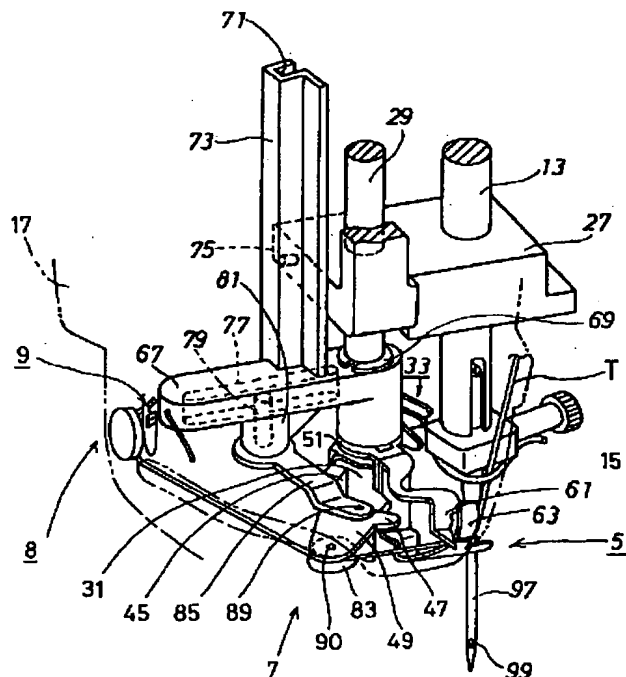
(74) 代理人 弁理士 足立 勉

(54) 【発明の名称】 ミシンの糸端処理装置

(57) 【要約】

【目的】 ミシンの糸掛けを目視しながら行えるようにして、操作性の向上を図る。

【構成】 ミシン頭部の正面には上下方向に延びる糸案内溝1、ミシン頭部の側面には前後方向に延びる糸案内溝3が形成されている。その糸案内溝3の糸通路には、略垂直方向に付勢して上糸Tを保持する糸保持部7が備えられている。糸保持部7より糸案内下流側で、糸案内溝3の上方には、左右方向に付勢して上糸Tを保持する糸保持部8が備えられている。この糸保持部8は、左右方向に延びる軸によって上糸Tの案内方向が後方から前方に反転するように構成されている。糸保持部8より手前で糸保持部8よりも若干高い位置には、反転された上糸Tの先端部を切るための糸切断部9が備えられている。



【特許請求の範囲】

【請求項1】 縫針の目孔に糸を通す糸通し装置を備えたミシンの縫い出し前に、該縫針の目孔から引き出される糸長を所定の長さに設定するミシンの糸端処理装置であって、

上記ミシンの縫い出し前に、糸供給源から上記縫針の近傍を通って糸を掛ける糸掛け準備経路と、

上記準備経路上に設けられ、糸を係止すると共に糸通し時に上記縫針に接近し、該糸を上記縫針の目孔前に運ぶ糸係止部と、

上記準備経路上において上記糸係止部より下流側に設けられ、上記準備経路に対して略垂直方向に付勢されて上記糸を把持する糸把持部と、

上記準備経路上における上記糸把持部より下流側であって、目視可能なミシン側面付近に設けられ、上記把持された糸を上記糸係止部から所定距離隔てた位置で切断する糸切断部と、

上記糸切断部の上流側かつ上記糸把持部の下流側に設けられ、上記切断後の糸を保持する糸保持部とを備えたことを特徴とするミシンの糸端処理装置。

【請求項2】 上記糸通し装置が、糸通し時には上記目孔近傍の所定位置まで下降して目孔に糸を通すものとして構成された請求項1記載のミシンの糸端処理装置において、

上記糸把持部は、当該糸把持部への上記糸の挿入開始側が下方になるよう上記準備経路に対する垂直方向から所定角度斜め方向に付勢されて、上記糸を把持するよう構成されたことを特徴とするミシンの糸端処理装置。

【請求項3】 請求項1または2記載のミシンの糸端処理装置において、

上記糸通し装置の機構の一部としても働く上記糸係止部と糸把持部とは針棒台に取り付けられて上下動可能に構成され、一方、上記糸切断部と糸保持部とは面板の側面に固定的に設けられると共に、上記糸把持部は上記糸保持部よりもミシン前面側に配置されたことを特徴とするミシンの糸端処理装置。

【発明の詳細な説明】**【0001】**

【産業上の利用分野】 本発明はミシンの糸端処理装置に関し、詳しくは縫針の目孔に糸を通す糸通し装置を備えたミシンの縫製の準備に際して、縫針の目孔から引き出される糸の長さを設定するミシンの糸端処理装置に関する。

【0002】

【従来の技術及び発明が解決しようとする課題】 従来から、糸通し装置を備えたミシンにおいては、縫い出し前の準備として、糸供給源から上糸を引き出し、所定操作により縫針の目孔に上糸を通した後、その糸端を引いて緊張を与えながら縫針を昇降させて下糸を引出し、上糸、下糸を揃えてミシン頭部に装着された面板あるいは

針板等に設けられた糸切りに案内して切断していた。

【0003】 このような糸端処理装置として、例えば特開平3-133484号に示すものがある。これは、縫針の目孔に糸を通す糸通し装置を備えたミシンの縫い出し前に、縫針の目孔から引き出される糸長を所定の長さに設定する糸端処理装置であって、ミシンの縫い出し前に、糸供給源から縫針の近傍を通って糸を掛ける糸掛け準備経路と、準備経路上に設けられ、糸を係止すると共に糸通し時に縫針に接近し、糸を縫針の目孔前に運ぶ糸係止部と、準備経路上において糸係止部より下流側に設けられ、準備経路に対して略垂直方向に付勢され糸を把持する糸把持部と、準備経路上において糸把持部より下流側に設けられ、把持された糸を糸係止部から所定距離隔てた位置で切断する糸切断部とを備えるものである。

【0004】 この糸端処理装置による糸端処理の手順及び作動について図7を参照して説明する。縫い出し前に図示しない糸供給源から引き出した糸Tの端を作業者が指等をもって糸掛け準備経路101、103上に沿って導くと、まず、糸Tは糸係止部105に係止され、続いて糸掛け準備経路103に対して略垂直方向に付勢された糸把持部107に把持される。さらに、下流側に糸端を導くと、糸Tは、糸端と糸把持部107との間にて緊張しつつ、糸係止部105から所定距離隔てた位置で糸切断部109に到達し切断される。糸通し時には、糸Tに係止した糸係止部105が縫針197の目孔199前に接近するが、この時の係止位置と糸把持部107との距離は一定であるため、切断された糸端から係止位置までの糸長は一定となり、糸通し後の縫針197の目孔199から引き出された糸長は常に所定値となるというものである。

【0005】 しかしながら、糸把持部107は糸掛け準備経路103に対して略垂直方向に付勢される押え皿が糸Tを押圧する構成であるため、糸把持部107へ糸Tが侵入し確実に把持することができるようにするためには、図7(A)に示すように、糸掛け準備経路103をミシン頭部117の後方まで設ける必要があった。つまり糸Tが糸把持部107の押え皿の中側へ行くようにするために、図7(B)に示すように、糸把持部107を巻くように糸Tをもっていく必要があった。

【0006】 そのため、作業者は図7(A)中の矢印Yのように、糸端をミシン頭部117の後まで移動させていかないと糸切断部109まで導けないのであるが、糸端処理をするための糸切断部109が作業側から見てミシンの裏側に位置してしまい、ミシンの正面に居る作業者が目視して確認しながら糸掛け作業を行なうことができなくなっている。その結果、その作業を手探りで行なうか、あるいはその都度ミシンの裏側まで見えるような位置まで作業者自身が移動して目視しなくてはならなかった。したがって、作業の確実性・操作性の点でさらなる向上が期待されている。

【0007】そこで、本発明のミシンの糸端処理装置は上記課題を解決し、ミシンの縫製に際しての準備作業の確実性・操作性を向上させることを目的とする。

【0008】

【課題を解決するための手段、作用及び効果】上記目的を達成するためになされた請求項1に記載の発明は、縫針の目孔に糸を通す糸通し装置を備えたミシンの縫い出し前に、該縫針の目孔から引き出される糸長を所定の長さ設定するミシンの糸端処理装置であって、上記ミシンの縫い出し前に、糸供給源から上記縫針の近傍を通して糸を掛ける糸掛け準備経路と、上記準備経路上に設けられ、糸を係止すると共に糸通し時に上記縫針に接近し、該糸を上記縫針の目孔前に運ぶ糸係止部と、上記準備経路上において上記糸係止部より下流側に設けられ、上記準備経路に対して略垂直方向に付勢されて上記糸を把持する糸把持部と、上記準備経路上における上記糸把持部より下流側であって、目視可能なミシン側面付近に設けられ、上記把持された糸を上記糸係止部から所定距離隔てた位置で切断する糸切断部と、上記糸切断部の上流側かつ上記糸把持部の下流側に設けられ、上記切断後の糸を保持する糸保持部とを備えたことを特徴とするミシンの糸端処理装置である。

【0009】本糸端処理装置によれば、縫い出し前に糸供給源から引き出した糸端を糸掛け準備経路上に沿って導くと、まず、糸は糸係止部に係止され、続いて糸掛け準備経路に対して略垂直方向に付勢された糸把持部に把持される。さらに、下流側に糸端を導くと、糸は糸保持部に保持され、糸保持部下流の糸切断部に到達し切断することができる。なお、糸は糸保持部に保持されているため、糸切断部で糸を切るか否かは作業者が選択できる。どちらの選択においても確実に糸が掛かって保持される。そして、切断する際には、糸保持部を基点として引っ張って糸切断部に導けば容易に切断できるので切断操作もし易い。

【0010】そして、糸切断部は、目視可能なミシン側面付近に設けられているため、作業にとっては目視しながら、切断作業が行える。このように、糸端処理を目視しながら行えるため、その作業の確実性・操作性がより向上する。つまり、従来は図7に示すように、糸端処理をするための糸切断部が作業側から見てミシンの裏側に位置してしまい、作業者が目視して確認しながら作業を行なうことができなくなっていた。そのため、その作業を手探りで行なうか、あるいはその都度ミシンの裏側まで見えるような位置まで作業者自身が移動して目視しなくてはならなかったが、本案では、作業者が目視しながら切断作業を行うことができ、その点での作業の確実性・操作性が向上する。

【0011】なお、糸通し時には、糸を係止した糸係止部が縫針の目孔前に接近するが、この時の係止位置と糸把持部との距離は一定であるため、切断された糸端から

係止位置までの糸長は一定となり、糸通し後の縫針の目孔から引き出された糸長は常に所定値となる。

【0012】また、請求項2に示すように、糸把持部は、当該糸把持部への糸の挿入開始側が下方になるよう準備経路に対する垂直方向から所定角度斜め方向に付勢されて糸を把持するようにすることが考えられる。これにより以下の作用・効果を奏する。つまり、糸通し時には糸通し装置が（上方にある）初期位置から下降して目孔近傍の所定の下方位置にまで移動し、その位置にて糸通し作業が開始される。この際、糸端部分は糸保持部に保持されているため移動せず、糸把持部は糸を下方に押そうとするが、糸把持部は準備経路に対する垂直方向から所定角度斜め方向に付勢されており、それは糸把持部への糸の挿入開始側が下方になるような斜め方向であるので、その斜め方向への傾きにしがたって、糸は糸把持部の中へ中へと入っていくようになり、一層確実に把持されることとなる。

【0013】もちろん糸を糸掛け準備経路上に沿って導く操作中において、糸が糸把持部の中へ十分に入り込むように操作することも可能であるが、そのためには作業者が糸を意識的に強く引っ張って中へと導く必要がある。本構成を採用すれば、糸を糸掛け準備経路上に沿って導く操作においては、糸が糸把持部の中へ十分に入ってなくても、その後の糸通し装置の動きによって自動的に中へ中へと入っていくようになり、確実な把持状態の形成には好ましい。

【0014】特に、請求項3に示すものでは、糸通し装置の機構の一部としても働く糸係止部と糸把持部とは針棒台に取り付けられて上下動可能に構成され、一方、上記糸切断部と糸保持部とは面板の側面に固定的に設けられると共に、糸把持部は糸保持部よりもミシン前面側に配置されている。そのため、作業者は糸を糸係止部に係止させた後、糸掛け準備経路に沿ってミシン手前側からミシン側面側に導くと、糸は糸保持部及び糸切断部に至るため、操作がやり易い。

【0015】

【実施例】以上説明した本発明の構成・作用を一層明らかにするために、以下本発明のミシンの糸端処理装置の実施例について説明する。図1は、一実施例としてのミシンの糸端処理装置（以下、単に糸端処理装置という）を備えた糸通し装置の斜視図、図2は、その糸通し装置を備えたミシン頭部の概略斜視図である。

【0016】本糸端処理装置は、縫製に先立ち上糸Tを掛ける糸掛け準備経路として、ミシン頭部に形成された2つの糸案内溝1、3と、その糸案内溝1、3の間で糸掛け準備経路上に設けられた糸係止部5と、糸案内溝3の内側に設けられた糸把持部7と、糸案内溝3の終点位置に設けられた糸保持部8及び糸切断部9とを備える。

【0017】糸案内溝1は、図2に示すように、ミシン上部に設けられた上部糸掛け11から下方（図示しない

ミシンベッド方向)へ上下方向に延びて形成され、針棒13に装着された針棒系案内15の近傍にまで延びている。一方、系案内溝3は、ミシンの頭部を覆う面板17の操作側下方から斜め上方に向かって、ミシン頭部の側面のやや奥側まで形成されている。

【0018】系係止部5および系把持部7は、後述する系通し装置の機構の一部を担うものであり、この系通し装置について、図1を参照して説明する。系通し装置は、ミシン機枠(図示略)に固定される針棒台27に上下動可能に挿通支持される針棒13に平行で、針棒台27に上下動可能に挿通支持される系通し棒29を備える。この系通し棒29の下端部にはフック保持部31が固着されており、このフック保持部31には水平に延出して略直角方向に折曲するフック部33が取り付けられている。

【0019】フック部33は、図4に示すように、先端に鉤の手状の鉤部35が形成されたフック37と、フックの両側に位置し先端に「V」字状に系導入溝39が形成された2枚のフックガード41、43とからなる。また図1に示すように、フック保持部31にはフック部33と反対方向に延出する突出片45が一体に形成されている。この突出片45の先端には系ガイド片47及び皿支持片49が突出して形成されている。系ガイド片47は水平方向に突出し、皿支持片49は先端がやや下がるように下斜め方向に突出している。

【0020】系通し棒29の下端には、さらに、フック保持部31を「コ」字状に上下に挟み、系通し棒29に対して回転可能に形成されたリンクレバー51が取り付けられており、このリンクレバー51の水平方向に延出された端部にピン53が垂直に突設されている。また、リンクレバー51の「コ」字状背面には、系係止部5が固着されている。

【0021】系係止部5は、図5に示すように、リンクレバー51の背部に固定される固定板55と、固定板55の上・下端から水平方向に突出し中央部が湾曲したアーム57、59と、アーム57の突出方向先端から下方向に延出した押え爪61と、アーム59の突出方向先端から上方向に延出した系掛け爪63とからなり、これらは一体に形成されている。押え爪61は、その先端が固定板55から離れる方向に湾曲されると共に、その湾曲開始位置に系掛け溝65が形成されている。

【0022】系通し棒29には、図1に示すように、フック保持部31の上部において、摺動ガイド67が針棒13の反対方向に突出して遊挿されており、Eリング69により上下位置が規制されている。さらに、摺動ガイド67には系通し棒29に平行で軸方向に溝71が形成された支持枠73が一体に形成されており、この溝71内に針棒台27に突設されたピン75が遊嵌している。従って、系通し棒29が上下動すると、これに伴いこの摺動ガイド67及び支持枠73も一体的に上下動する

が、系通し棒29の軸回転に対しては追従しない。

【0023】摺動ガイド67には、所要長のガイド溝77が穿設され、このガイド溝77内にリンク機構を構成するリンクピン79が摺動自在に遊嵌される。このリンクピン79は、第1リンク板81及び第2リンク板85を軸支する。第1リンク板81は、図3(A)に示すように、両端に、リンクピン79とリンクレバー51に突設されたピン53が各々回転可能に挿通されている。

【0024】また、一端がリンクピン79に軸支された第2リンク板85の他端は、フック保持部31の突出片45の先端と共通にピン89が回転可能に挿通される。このように、リンクピン79により共通に軸支される第1リンク板81及び第2リンク板85と、この第1リンク板81にピン53を介して連結するリンクレバー51と、第2リンク板85にピン89を介して連結する突出片45とによってリンク機構が構成される。

【0025】系把持部7は、この突出片45の皿支持片49に取り付けられており、以下のように構成される。即ち、図6に示すように、先端がやや下がるように下斜め方向に突出した皿支持片49の先端付近において、支持ピン90に摺動可能に軸支される押え皿83を設け、この押え皿83の内側にコイルバネ91を装着して、押え皿83を皿支持片49方向に付勢することにより、押え皿83と皿支持片49とを圧接状態に保持している。なお、皿支持片49には、押え皿83に面して支持ピン90から所定距離離れた位置に系抜き溝93が系道に沿って凹設されている。

【0026】次に系保持部8及び系切断部9について説明する。系保持部8と系切断部9は系案内溝3の終端部の上方にあたる面板17の側面に設けられている。系保持部8は、基本的には上記系把持部7の同様の構成であり、系把持部7における押え皿83と同様のものが面板17方向に付勢されている。そして、系切断部9は、糸としては系保持部8よりも手前側(ミシン前面側)に配置されている。但し系掛け準備経路としては系保持部8よりも下流側となる。そして、系切断部9は上方に刃面が向いたカッターを備えている。

【0027】糸の流れを簡単に説明すると、系案内溝3の終端部まで導いた糸Tを系保持部8を半周程度巻くようにして系切断部9まで持って来るため、糸Tは系保持部8にしっかりと保持される。その状態で糸Tの端をもって引っ張りながら系切断部9のカッターによって簡単に糸Tを切断することができる。

【0028】次に、縫製に先立ち、準備作業としての糸掛けの操作について説明する。ミシンの使用者は、図2に示すように、糸駒95から供給される上糸Tを以下の順に準備する。まず、上糸Tを上部系掛け11に掛け、系案内溝1に導入し、針棒系案内15に掛ける。そして、糸端を左方向に引きながら上糸Tを系案内溝3に誘導すると、この過程において、上糸Tは、系掛け爪63

の外側から押え爪61の内側に導入され、糸掛け爪63に係止される(図1参照)。

【0029】続いて、図2の矢印d方向に糸端を誘導すると、上糸Tは、図6(A)に示すように、皿支持片49の先端部下面を矢印e方向に摺動して、糸把持部7を構成する押え皿83と皿支持片49との間に挿入される。さらに、図2の矢印d方向に糸端を誘導すると、上糸Tは、中心方向、つまり支持ピン90方向(図6(B)の矢印f方向)へ引き寄せられ一層強固に挟持される。

【0030】そして、準備操作の終了として、上糸Tは糸案内溝3の終点部に導かれ、上述したように糸把持部8に保持された状態で、その下流側にある糸切断部9で切断される。即ち、この糸掛け準備操作は、上糸Tを糸案内溝1, 3に沿って誘導するという一連の動作だけで終了するわけである。なお、この状態では糸切断部9と糸把持部7とが所定位置にあるため、切断された糸端から糸把持部7までの糸長は、常に一定となる。

【0031】図1及び図3(A)は、このように上糸Tが準備された状態を表す。次に、糸端処理装置を備えた糸通し装置の動作について説明する。なお、この動作は、糸通し棒29の昇降・回転動作に基づいてなされ、この糸通し棒29の動作を司る機構の詳細については、本願出願人の実公昭61-35188号公報に記載されている。以下は糸通し装置の各部の動きを中心に説明する。

【0032】上述したように上糸Tが準備されると、操作者は、操作レバー(図示略)を操作して糸通し棒29を下降させ、さらに、図3(A)の矢印g方向に回転させる。このとき、糸通し棒29に固着されたフック部33および突出片45は、糸通し棒29の回転と共に、それぞれ同図(B)の矢印h, i方向に回転し、フック部33のフック37は縫針97の目孔99に貫入する。突出片45の回転により、摺動ガイド67のガイド溝77内に遊嵌されたリンクピン79は、第2リンク板85を介して矢印j方向に移動し、さらに、リンク板81を介してピン53を矢印k方向に移動させる。そのため、リンクレバー51も矢印k方向に回転し、リンクレバー51の背部に固定された糸係止部5が矢印m方向に回転し縫針97に接近する。

【0033】このような動作により、一端を糸把持部7に把持された上糸Tは、その糸把持部7と糸係止部5との離隔が大きくなることから、その間の上糸Tは緊張される。このとき、糸係止部5の回転により、糸掛け爪63は、糸把持部7との間の上糸Tの緊張を保持しつつ、糸供給源側に摺動し、糸供給源側の上糸Tのたるみを吸収する。さらに回転して糸掛け爪63が縫針97に近づくと、上糸Tは、糸掛け爪63から外れて押え爪61の糸掛け溝65に導入され、この糸掛け溝65と糸把持部7との間で上糸Tが緊張されて、縫針97の目孔99前

に誘導される(図3(B)の状態)。この状態においては、フック37は図4(A)に示すように、縫針97の目孔99に貫入しており、緊張された上糸Tが鉤部35の鉤の手内側に導入される。

【0034】一方、糸把持部7に把持された上糸Tは、リンクピン79と共に押え皿83が糸通し棒29から遠ざかるため、上糸Tは緊張すると共に、中へ中へと、つまり指示ピン90方向(図6(B)の矢印f方向)にぐいぐいと進み、一層強固に挟持され、上糸Tの緊張に対して糸係止部5の方向に摺動しない。従って、この糸把持部7と糸係止部5との間に、上糸Tが十分に緊張されるため、上糸Tはフックガード41, 43の糸導入溝39に導入されてフック37の鉤部35に確実に捕捉される。また、上糸Tが糸把持部7に把持され摺動しないことから、糸端から糸係止部5までの糸長は、常に一定となる。

【0035】次に、糸通し棒29を図3(C)の矢印n方向に逆回転させると、フック部33は縫針97から矢印o方向に遠ざかると共に、突出片45が矢印p方向に回転する。従って、リンク機構を構成する各部材は、上述した動作に対して戻るように動作し、糸把持部7が矢印q方向に移動すると共に、糸係止部5が矢印r方向に回転して縫針97から遠ざかる。このとき、糸係止部5の糸掛け溝65に係止されていた上糸Tは、この移動によりそこから外れて緊張が解かれ、図4(B)に示すように、フック37に捕捉されて縫針97の目孔99から引き出されていく。このフック37の引き抜き動作により、上糸Tはフック37の鉤部35で折れ曲がり、この鉤部35と糸把持部7との間の上糸Tのたるみが吸収されて、再び上糸Tが緊張する。

【0036】さらに、フック37に図3(C)の矢印o方向の力が働き続けると、糸把持部7に把持された上糸Tは、その把持力がフック37の引き抜き力に負けて、図3(C)の矢印s方向に摺動する。この摺動が始まると、上糸Tは、図6(B)に示すように、押え皿83と皿支持片49との間隙がくさび状になっていることから、矢印t方向に移動し、同図(C)に示すように糸抜き溝93に落ち込む。従って、上糸Tが押え皿83からの押圧が解除されて、この糸抜き溝93内を抵抗少なく摺動するため、糸把持部7とフック37の鉤部35との間の上糸Tの緊張がゆるみ、フック37の引き抜き動作に伴い、上糸Tが容易に縫針97の目孔99から引き抜かれる。

【0037】糸通し棒29は、所定角度の逆回転が終了すると、上昇動作に入る。この上昇動作により、フック部33、糸係止部5、糸把持部7は、リンク機構を構成する各部材と共に一体に上昇する。このときフック37の鉤部35に捕捉された上糸Tは、図4(C)に示すように引き上げられて、さらに目孔99から引き抜かれるが、その上昇過程において、上糸Tの目孔99における

摩擦力や上糸Tの自重等により、フック37が上糸Tを保持しきれなくなり、上糸Tは鉤部35から外れる。

【0038】以上説明した本実施例のミシンの糸端処理装置によれば、以下のような効果を奏する。

① 縫い出し前に糸駒95から引き出した糸端を糸掛け準備経路上に沿って導くと、まず、糸Tは糸係止部5に係止され、続いて糸保持部7に把持される。さらに、下流側に糸端を導くと、糸Tは糸保持部8に保持され、糸保持部8下流の糸切断部9にて切断することができる。なお、糸Tは糸保持部8に保持されているため、糸切断部9で糸を切るか否かは作業者が選択できる。どちらの選択においても確実に糸Tが掛かって保持される。そして、切断する際には、糸保持部8を基点として引っ張って糸切断部9に導けば容易に切断できるので切断操作もし易い。そして、糸保持部8及び糸切断部9は、目視可能なミシン側面付近に設けられているため、作業者にとっては目視しながら、切断作業が行える。

【0039】このように、糸端処理を目視しながら行えるため、その作業の確実性・操作性がより向上する。つまり、従来は図7に示すように、糸端処理をするための糸切断部109が作業側から見てミシンの裏側に位置してしまい、作業者が目視して確認しながら作業を行なうことができなくなっていた。そのため、その作業を手探りで行なうか、あるいはその都度ミシンの裏側まで見えるような位置まで作業者自身が移動して目視しなくてはならなかったが、本案では、作業者が目視しながら切断作業を行うことができ、その点での作業の確実性・操作性が向上する。

② なお、糸掛け準備経路上の上流側から糸係止部5、糸保持部7を設け、さらに、その終点部に糸保持部8と糸切断部9を設けたことから、縫製に先立ち準備する糸掛けの一連の動作の終了時に、上糸Tを、縫針97の目孔99から糸端までの距離である糸端長を所定の長さにて切断することができる。一方、上糸Tが縫針97の目孔99から引き出されるときには、糸保持部7に挟持された上糸Tは、糸抜き溝93に落ち込むため、この引出しを妨げない。

③ また、本実施例の糸保持部7は、糸掛け準備経路に対する垂直方向から所定角度斜め方向に付勢されて糸を把持するようにしている(図1、6参照)。これにより、糸通し時に糸通し装置が下降すると、糸端部分は糸保持部8に保持されているため移動せず、糸保持部7は糸Tを下方に押そうとするが、糸保持部7の押え皿83は所定角度斜め方向に付勢されているため、その斜め方向への傾きにしがたがって、糸Tは糸保持部7の中へ中へと、つまり支持ピン90方向(図6(B)の矢印f方向)へ引き寄せられ一層確実に把持されることとなる。

【0040】もちろん糸Tを糸掛け準備経路上に沿って導く操作中において、糸Tが糸保持部7の中へ十分に入り込むように操作することも可能であるが、そのために

は作業者が糸Tを意識的に強く引っ張って中へと導く必要がある。本構成であれば、糸Tを糸掛け準備経路上に沿って導く操作においては、糸Tが糸保持部7の中へ十分に入らなくても、その後の糸通し装置の動きによって自動的に中へ中へと入っていくようになり、確実な把持状態の形成には好ましい。

【0041】そしてさらに言えば、このように糸保持部7を、糸掛け準備経路に対する垂直方向から所定角度斜め方向に付勢されて糸Tを把持するように構成して、糸が自動的に中へ中へと入っていくようにすることで、糸保持部8と糸切断部9をよりミシン前面側に持ってくるることができる。つまり、図3に示すように、糸Tは糸保持部7によって所定角度曲げられることで、糸保持部7の中へ入り込むのであるが、この曲げられる角度が大きいほど入り込み易い。ここで、上記したように糸保持部7を糸掛け準備経路に対する垂直方向から所定角度斜め方向に付勢されるようにすれば、その構成自体によっても糸Tが糸保持部7の中へ入り込み易くなる。そのため、糸保持部7が糸掛け準備経路に対する垂直方向に付勢されるものに比較すれば、糸保持部8と糸切断部9をよりミシン前面側に持ってくることができる。

【0042】以上本発明の実施例について説明したが、本発明はこうした実施例に何等限定されるものではなく、本発明の要旨を逸脱しない範囲において、種々なる態様で実施し得ることは勿論である。

【図面の簡単な説明】

【図1】一実施例としてのミシンの糸端処理装置を備えた糸通し装置の斜視図である。

【図2】糸通し装置を備えたミシン頭部の概略斜視図である。

【図3】糸端処理装置を備えた糸通し装置の動作を示す説明図である。

【図4】フック部の動作を示す説明図である。

【図5】糸係止部の斜視図である。

【図6】糸保持部の動作を示す説明図である。

【図7】従来の糸端処理装置を示す説明図である。

【符号の説明】

1, 3…糸案内溝	5…糸係止部
7…糸保持部	8…糸保持部
9…糸切断部	11…上部糸掛け
13…針棒	17…面板
27…針棒台	31…フック保持部
33…フック部	37…フック
45…突出片	47…糸ガイド片
49…皿支持片	51…リンクレバー
53…ピン	61…押え爪
63…糸掛け爪	77…ガイド溝
79…リンクピン	81…第1リンク板
83…押え皿	85…第2リンク板
89…ピン	90…支持ピン

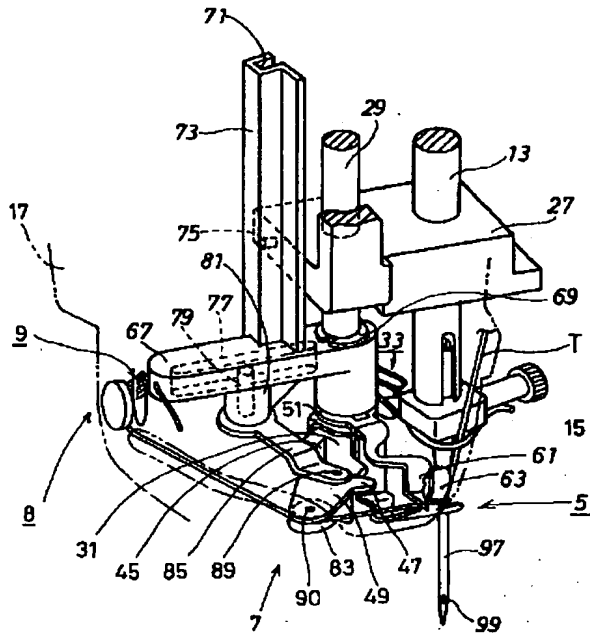
9 1…コイルバネ
9 5…糸駒

9 3...糸抜き溝
9 7...縫針

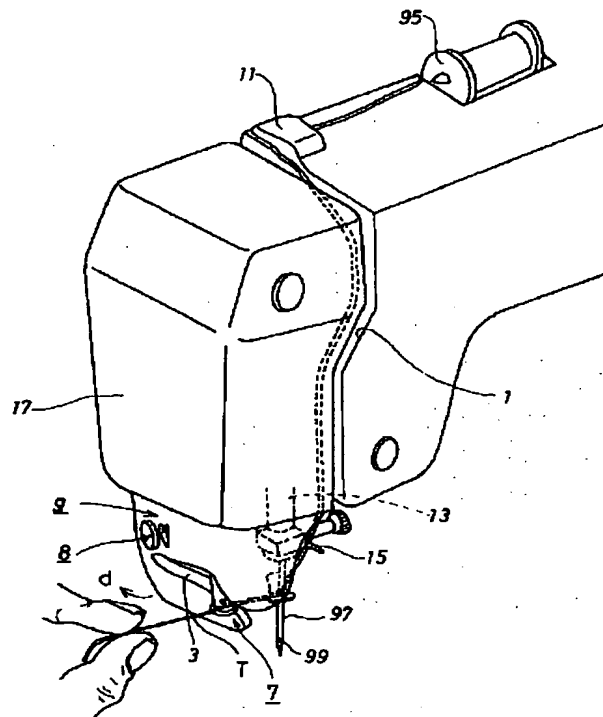
9 9...目孔

T…糸 (上糸)

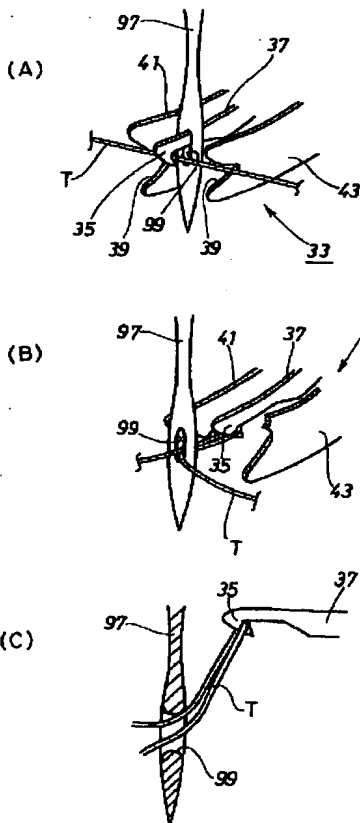
【図 1】



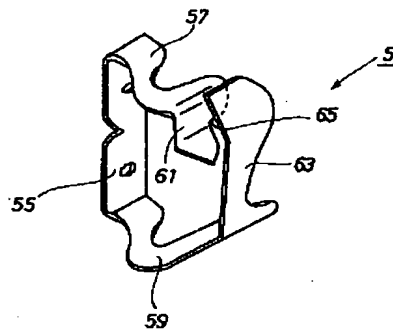
【図 2】



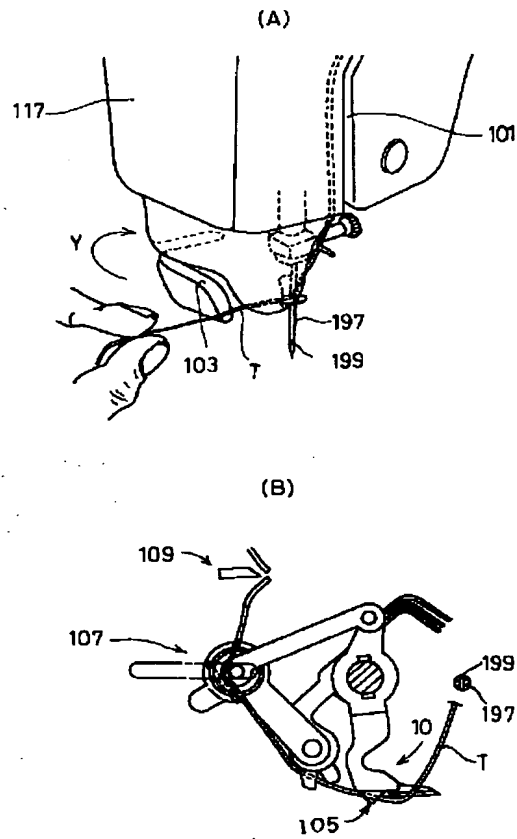
【図 4】



【図 5】



【図7】



【手続補正書】

【提出日】平成7年1月17日

【手続補正1】

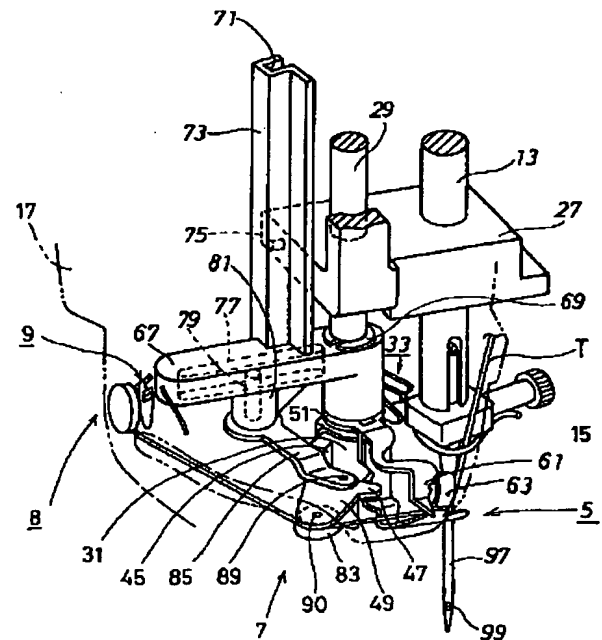
【補正対象書類名】図面

【補正対象項目名】図1

【補正方法】変更

【補正内容】

【図1】



【手続補正2】

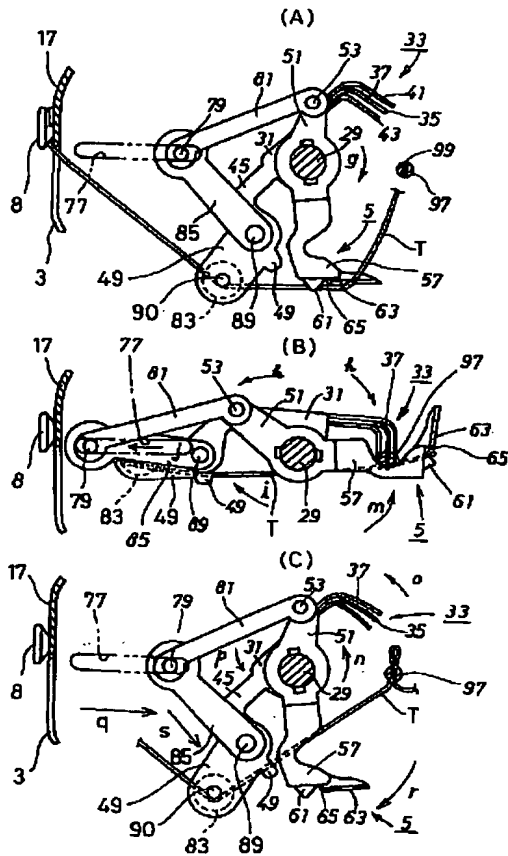
【補正対象書類名】図面

【補正対象項目名】図 3

【補正方法】変更

【補正内容】

【図 3】



【手続補正 3】

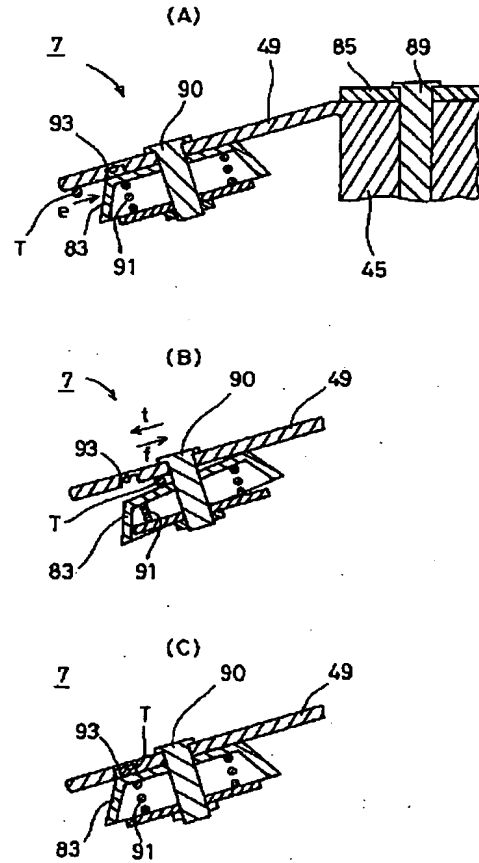
【補正対象書類名】図面

【補正対象項目名】図 6

【補正方法】変更

【補正内容】

【図 6】



【手続補正 4】

【補正対象書類名】図面

【補正対象項目名】図 7

【補正方法】変更

【補正内容】

【図 7】

